

IN THE CLAIMS:

23 1. (Currently amended) An apparatus for measuring displacement, the apparatus comprising:

a machine element having ~~an interior~~ a wall body and an exterior wall and further having a first end wall substantially enclosing the interior wall and the exterior wall defining an interior wherein the wall has an interior surface and a length defined between a first end and a second end;

a first wall at the first end;

a second wall at the second end substantially enclosing the interior;

a shaft element movable within the machine element;

a head element attached to the shaft element adjacent to the interior wall surface of the machine element;

a light source attached to the machine element; and

a sensor attached to the machine element and positioned to detect intensity of light within the machine element wherein the intensity of light corresponds to a position of the head element within the machine element at any point between the first end and the second end.

2. (Original) The apparatus of Claim 1 further comprising:

a coating on the shaft element.

3. (Currently amended) The apparatus of Claim 1 further comprising:

a coating on the interior wall surface of the machine element.

4. (Original) The apparatus of Claim 1 further comprising:

a seal disposed around the shaft element.

5. (Currently amended) The apparatus of Claim 1 further comprising:

~~a second end wall opposite to the first end wall wherein the second end wall has a groove~~ a second sensor attached to the first wall.

6. (Currently amended) The apparatus of Claim 1 further comprising:

a first brush positioned at the ~~end~~ second wall of the machine element.

7. (Original) The apparatus of Claim 6 wherein the first brush is constructed from wire.

8. (Currently amended) The apparatus of Claim 1 further comprising:

~~a second brush positioned at the end~~ light source attached to the machine element at the first wall of the machine element.

9. (Currently amended) The apparatus of Claim 8 ~~wherein the second brush is constructed from bronze~~ 1 wherein the light source is attached at the second wall.

10. (Currently amended) The apparatus of Claim 1 further comprising:

~~an additional sensor attached to the machine element and positioned to detect intensity of light within the machine element~~ a coating on the head element.

11. (Currently amended) An apparatus for cleaning a machine component, the apparatus comprising:

ca3  
cont'd

a machine element having ~~an interior wall and an exterior wall~~  
~~and further having an end wall substantially enclosing the interior~~  
~~wall and the exterior wall~~ a body defining an interior wherein the  
body has an interior surface and a length defined between a first  
end and a second end;

a shaft element movable within the machine element;

a head element attached to the shaft element and adjacent to  
the interior ~~wall~~ surface of the machine element; and

a first brush positioned ~~at the end~~ exterior to the body wall  
of the machine element in contact with the shaft element.

12. (Original) The apparatus of Claim 11 further comprising:

a seal disposed around the shaft.

13. (Original) The apparatus of Claim 11 further comprising:

a coating on the shaft element.

14. (Currently amended) The apparatus of Claim 11 further  
comprising:

a second brush positioned ~~at the end wall~~ exterior to the body  
of the machine element.

15. (Original) The apparatus of Claim 11 further comprising:

a light source attached to the machine element.

16. (Original) The apparatus of Claim 11 further comprising:

a sensor positioned to receive reflected light within the  
machine element.

17. (Currently amended) A method for measuring displacement of a

machine element, the method comprising the steps of:

*AB  
Cont'd*  
providing ~~a machine element having an interior and an exterior wall and further having an end wall~~ a machine element having a body defining an interior wherein the body has an interior surface and a length defined between a first end and a second end;

providing a shaft element capable of movement within the machine element;

attaching a head element to the shaft element;

positioning the head element adjacent to the interior ~~wall~~ surface of the machine element;

attaching a light source to the machine element on a first side of the head element;

attaching a sensor to the machine element on a second side of the head element wherein the first side and the second side are not the same; and

measuring intensity of light within the machine element from reflected light detected by the sensor.

18. (Original) The method of Claim 17 further comprising the steps of:

moving the shaft element; and

producing an output signal as the shaft element moves within the machine element.

19. (Currently amended) The method of Claim ~~17~~ 18 further comprising the steps of:

providing a processing unit that receives the output signal;  
and displaying the output signal.

20. (Currently amended) The method of Claim 17 further comprising  
the step of:

positioning a seal ~~at the end wall of~~ exterior to the machine  
element.

21. (Original) The method of Claim 17 further comprising the step  
of:

attaching a first brush to the machine element.

22. (Currently amended) The method of Claim ~~17~~ 21 further  
comprising the step of:

attaching a second brush to the machine element.

---